

Societal Implications of Innovations in Robotics

Executive Summary

The goal of this project was to investigate the history, future, socio-economic benefits, and potential issues of robotic innovation in various sectors. Robots provide many benefits to society and the industries they work in. However, in some industries there are major moral or social issues that must be discussed and overcome before robotics in those sectors can be wholeheartedly adopted. By analysing these advantages and disadvantages society can understand where robotics may fit in the future and how they can help advance society.

In the space sector rovers, robotic manipulators, and probes can provide many benefits. They develop scientific and technological advancements in many fields, including computer science, materials engineering, and mechanical engineering, they enable collaboration between nations, provide economic benefits to many countries, keep astronauts safe, and complete tasks that humans are unable to do. There are some minor issues with using robots to do tasks in space, such as the high costs, the use of large amounts of resources, and pollution. The Canadarm that was developed in the late 1970s and launched in 1981 is a prime example of how these robots can bring nations together, advance technology, and help humans complete never before done tasks.

In the transportation sector, robotics has been playing a crucial role in the safe, efficient, and reliable transportation of people and goods. A lot of what was seen as science fiction a few decades ago is now a reality. Self-driving cars, flying taxis and drone delivery of goods are now widely tested across industries and geographies. Field trials have shown the potential economic gains and social equality it can bring. But these innovations also have a fair share of doubt, dilemmas, trust issues and job insecurity among the public. There are plenty of benefits robots bring to the industries that employ them with a few drawbacks. The future of robots has many interesting and beneficial innovations in the past and still to come, they will help humans with all kinds of tasks and propel society to greater heights. It is recommended that society continues to advance the field of robotics in the future.

The use of robotics has also completely transformed the way modern militaries operate. The use of UAVs for reconnaissance and precision strikes has made air forces more effective and the use of ground robots has allowed dangerous tasks to be completed without human soldiers being harmed. Future innovations in robotics may include networked swarms and autonomous drones, although there are many ethical concerns that have been raised.

Industrial manufacturing is also another area that has been completely transformed due to robotics. The technology is commonly used to take over dangerous, repetitive, and labor-heavy tasks in the manufacturing process. While the technology started in the automotive industry, the advancement in both hardware and software in recent years has allowed for industrial robotics to branch out and be applied in various other industries, including food packaging, electronics, and pharmaceuticals. The prospects of industrial robots are brighter than ever, mostly due to the growing interest in artificial intelligence and the radical change in modern business' paradigm due to the pandemic. Despite the advantage that it brings, future implementations of industrial robots must be done with caution since it may come at a cost of millions of low-skilled workers losing their jobs. Strict policies and regulatory actions are needed to ensure that the technology does not cause further social unrest

Nowadays, there is a very important relation between healthcare and robotics. Their implementation in healthcare has allowed the staff in the medical field to optimize process as well as upgrade quality. Even though there are several downfalls from their implementation, we will discuss in detail their impact in this sector from the first robot to present time. Additionally, understanding both history and benefits, we are able to provide insight on the possible future of robotics in healthcare using several economic and science metrics

After analyzing the strengths and weaknesses of robotics in these industries many different conclusions were drawn and different recommendations for society are being proposed. In the space sector and the healthcare sector the issues were far outweighed by the positives robotics can have for society and therefore it is recommended that society continue to invest and research robotic applications in these industries. Transportation and manufacturing have some larger issues that may affect society negatively and therefore advancements in robotics in these areas need to have more forethought, research, and mitigation plans put in place before robotics can be wholly adopted. Finally, in the defense industry there are large moral and ethical concerns with using robotics, these issues need to be evaluated and a societally decided solution reached before any further advancement should be undertaken in this industry. Robotics can provide substantial benefits to society but there are drawbacks that need to be understood and addressed.